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SCIENCE NEWS LETTER

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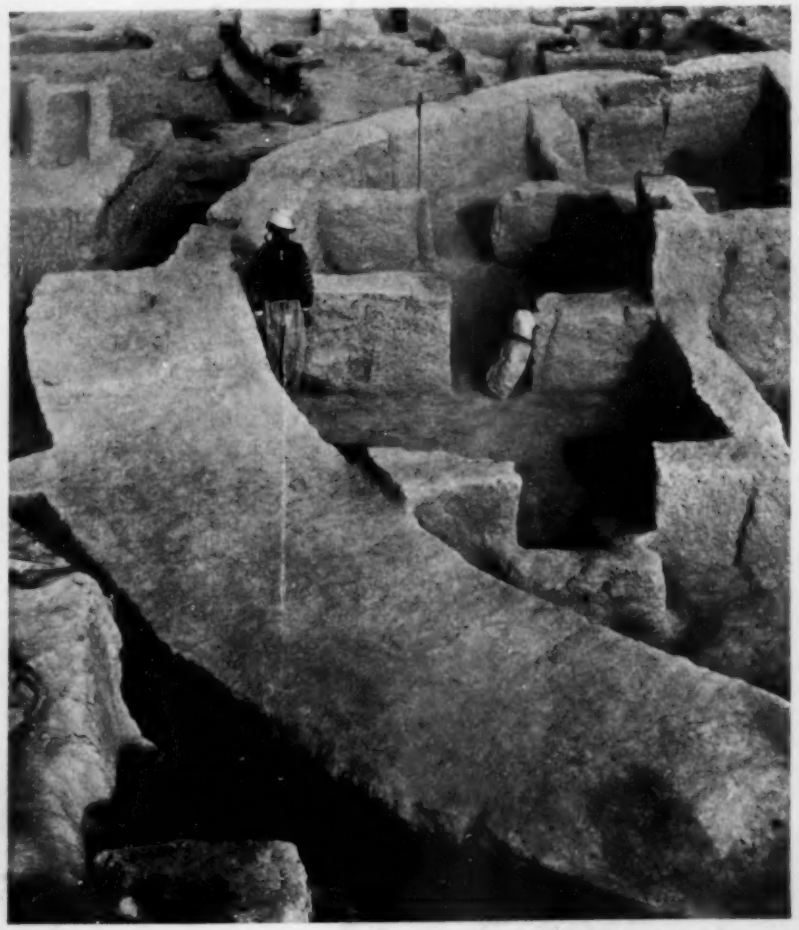

APRIL 25, 1936

From Oldest City

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Edited by WATSON DAVIS

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DO YOU KNOW?

North America's only true migratory insect is the monarch butterfly.

Certain varieties of tomatoes contain 50 per cent more vitamin C than others, it is found.

Pneumonia patients should never be left unwatched, because of the danger of delirium which may even lead to suicide.

A new radio station in Jerusalem will broadcast programs in the three official languages of Palestine, which are English, Arabic, and Hebrew.

A famous pirate haunt called Bull Island, near Charleston, S. C., has been made a refuge for herons and other birds that come there.

Pieces of polished red chalk found in central Europe have been pronounced lipsticks used by people of the Old Stone Age, 30,000 years ago.

An X-ray apparatus invented by a German is widely used in German shoe stores to make sure that a shoe does not cramp the bones of the foot.

Portrait death masks made by Indians several thousand years ago have been found in burial mounds in Wisconsin.

While less famous than the skunk, the weasel possesses glands that are similar and that secrete a fluid of strong odor.

The Field Museum has a model of a rattlesnake's open mouth, showing the harmless rows of small teeth and the poison fangs which are long, curved, and hollow.

Evanston, Illinois, is to have a city ambulance equipped with two-way radio apparatus, thus enabling the ambulance to send word ahead to the hospital to be ready with operating room or other special arrangements when a patient arrives.

According to a psychological investigation stenographers consider the ten most important traits in stenographers to be as follows, in order: ability to follow directions, carefulness in detail, responsibility, courtesy, speed, self-confidence, pleasing appearance, systematic habits, alertness, initiative.

WITH THE SCIENCES THIS WEEK

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SEISMOLOGY

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SURGERY

How can the surgeon help the diabetic? p. 265.

MEDICINE

Barrier to Virus Discovered; May Aid Paralysis Fight

Structure Between Nerves and Muscles Stops Passage Of Disease Virus in Mice; Young Animals Without It

A STRUCTURE between the nerves and muscles of the body which acts as a barrier to stop the passage of a disease causing virus was reported by Drs. Albert B. Sabin and Peter K. Olitsky, Rockefeller Institute for Medical Research, New York City, at the meeting in Boston of the American Association of Immunologists and the American Association of Pathologists and Bacteriologists.

Discovery of this barrier may shed light on resistance to infantile paralysis. The studies reported were made on mice, not men, and concerned another disease than infantile paralysis. Like infantile paralysis, however, this mouse disease is caused by a virus that attacks the brain and central nervous system.

The barrier that checks passage of the disease virus does not exist in young mice. When the virus gets into their muscles it easily reaches the nerves, travels along them to the brain, and causes disease and death. Older mice, however, have developed this protective barrier and seem to have another barrier in the brain, so that even if the virus reaches the brain, its progress is blocked there and the rest of the nervous system is protected against it. In infantile paralysis, it has previously been reported, the lining membranes of the nose in some individuals seem to act as a barrier blocking the passage of the disease virus. What makes the nose lining an effective barrier in some persons and not in others is not yet known. Studies such as the Rockefeller scientists reported here on the mouse disease may in the future provide the explanation. In the mouse disease, the barrier is apparently built up in connection with the aging process. While more children than adults get infantile paralysis, it does not necessarily follow that development of the barrier to the passage of the infantile paralysis virus depends on age.

According to another infantile paralysis investigator, Dr. Lloyd Aycock of Harvard Medical School, resistance to infantile paralysis depends on constitutional factors with which one is born.

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PHYSIOLOGY

Individual Muscle Fibers Repair Selves After Injury

HOW single fibers of muscle tissue heal themselves after injury was demonstrated by Prof. Carl Caskey Speidel of the University of Virginia, before the American Association of Anatomists meeting at Durham, N. C. Prof. Speidel has evolved a delicate technique whereby cellular details in the tail of a tadpole can be watched under a high power microscope—the tadpole being the while happily unconscious under anesthesia.

When the end of a muscle fiber is injured, as by an electric current or slight heat, it swells up and pulls back, immediately forming a hard, tough cap over itself. This cap persists for a time, but then dissolves into the liquid-filled vacancy it leaves. Muscle cell nuclei migrate. Presently the normal cross-striped appearance of the fiber is restored, and all is normal once more. The same fiber, Prof. Speidel found, can thus recover several times from successive injuries.

Male animals can be made to perform the traditionally female function of producing milk, Dr. W. R. Lyons of the University of California showed at the same meeting. After injecting into young male rabbits heavy doses of two female sex gland extracts, or hormones, he was able to squeeze milk out of their nipples which in male animals ordinarily remain in an undeveloped condition.

A relic of the reptilian ancestry of mammals was described by Dr. G. W. D. Hammett of the U. S. Biological Survey. It consists in a stage in the development of the red blood cells of the opossum, at which these cells closely resemble those of reptiles. The opossum belongs to one of the most primitive, least evolved orders of the mammals. The same reptile-like stage has not been found in higher mammals, Dr. Hammett said.

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ICHTHYOLOGY

First Known Photograph of Swordfish Stabbing a Boat

A SWORDFISH stabbing a boat with its powerful "sword" is shown in a remarkable and unique photograph now in the possession of the Academy of Natural Sciences in Philadelphia. So far as known, this is the only photograph of the kind ever made.

The attack took place in the Atlantic Ocean 120 miles southeast of Martha's Vineyard, Mass., and is thus recorded by Captain Ira Abbott, of Yarmouth, N. S.,

NEWS!

When a fish scuttles a boat—that's news! This is an unusual photograph made of a swordfish in the very act of spearing a 14-foot boat.

who at the time was sailing master of a yacht out of New York:

"We harpooned the fish shortly after sighting it, and put our fourteen-foot dory out with one man in it to bring the fish alongside the larger craft. I noticed he was having considerable trouble to get the fish alongside, so expected something like that to happen, and was standing by with my camera ready to get a picture.

"I saw the flash of the fish in the water as it approached the dory and pressed the trigger in time to get the picture as you see it. A few seconds after this picture was taken the fish made another savage lunge at the dory and ripped one plank entirely out, sinking the dory. We got the man all right, and shortly after landed the fish, weighing 350 pounds."

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SEISMOLOGY

Quakes Have Bad Reputation But Science Finds Their Uses

One Quake Killed 60,000 People, Another Moved Whole Mountains, But They Tell Scientists About the Earth

By CAPT. N. H. HECK, Chief, Division of Seismology, U. S. Coast and Geodetic Survey

EARTHQUAKES can move mountains—actually.

In China in 1920, in an earthquake at Kansu, whole mountains moved, and a stretch of roadway several hundred feet long was carried nearly half a mile.

Closing a railway tunnel is another Herculean feat of an earthquake. That happened in the Montana earthquake of 1925. A great rock slide was caused, and this closed a tunnel on a transcontinental railway. It narrowly missed burying a crack train.

Ability of earthquakes to kill large numbers of people is not to be despised. I believe, in the United States, some 36,000 persons lost their lives in traffic accidents last year. The 1923 Japanese earthquake took more lives than this. It killed 60,000 people by the fire caused by the quake.

In the United States, there have been comparatively few deaths from earthquakes, owing to the favorable hour at which most of our earthquakes have occurred.

In property loss, an earthquake can do forty million dollars worth of damage in a few minutes. This was the loss in the Long Beach earthquake. The property menace is particularly great where people have made no attempt to build for security against shocks.

Another menace is the psychological effect, especially damage to nerves, in cases when the quivering and rumbling of the earth is long continued.

But, so long as we have to have earthquakes, we may as well find some good in them. They do reveal facts about the structure of the earth which would otherwise be unknown or merely guessed by wild speculation. Just as the X-ray looks under the skin and brings out unsuspected facts about the human body, so the earthquake waves, properly interpreted, give us inside information about the earth.

The earth somewhat resembles an onion, though not a perfect one. The crust has been found to be made up of shells of varying thickness. The lowest of these shells ends apparently 30 to 50 miles beneath our feet. Since man, with the deepest mines and tunnels and drill holes, has never bored his way much deeper than two miles, you can see that the interior of the earth is not to be explored far by first-hand experience.

The core of this onion-like earth is probably metal, more than 4,300 miles in diameter. The core is probably, though not certainly, liquid metal, under tremendous temperature and pressure. And its surface is 1,800 miles beneath our feet.

What we call deep focus earthquakes are due to changes of pressure and other disturbing conditions as deep as 400 miles beneath us. Earthquake researches are now studying the mysteries of these deep focus quakes, for the results that we feel on top of the earth offer clues to the structural design. Our problem is to apply the rapidly accumulating knowledge of earth motions to this problem of the earth's inner plan and construction.

Earthquake science—the science of seismology—has given the factual basis for the so-called seismic method of prospecting for oil and minerals. By this method, artificial explosions create waves underground, and what is known about the performance of earthquake waves helps the mining geologist to interpret these waves, giving him a clue as to what forms of rock and mineral are hidden there.

Earthquake science is helpful, though earthquakes are not.

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ARCHAEOLOGY

War Tower in Bible Was "Old Fashioned" Even Then

See Front Cover

IMAGINE the same warfare tactics used for three thousand years!

It is hard to believe in this age of inventive speed.

That time amazingly stood still in this way in ancient Bible lands is revealed by latest excavations at that famous site, "the oldest city in the

OLD-FASHIONED

When Abimelech met his death attacking this round temple-battle tower, it was then an ancient war device at least 3,000 years old. According to the story King Abimelech was mortally wounded by a rock hurled by a woman from the wall above. In this drawing by the artist Dore, he is begging his armor-bearer to kill him so that death might not come from the hand of a woman. The ancient prototype of the round battle-tower, as found at Tepe Gawra, is shown on the front cover.

ROUND HOUSE FOR BATTLE

Here, plain to be seen, are the outlines of a round battle tower built some 6,000 years ago. Three thousand years later the same type of fortification was used and recorded in Bible history.

world," Tepe Gawra in Mesopotamia.

A joint expedition of the University Museum, University of Pennsylvania, and the American School of Oriental Research at Baghdad, has found ruins of a big round temple-tower at Tepe Gawra. The sweep of an almost perfect circle of brick foundations 60 feet in diameter has been unearthed. Outlines of 17 rooms can be traced. This big round house was built about 4000 B.C.

The field director of the expedition, Charles Bache, identified this as a fortress because of thick walls, single entrance, and stone weapons still lying in some of the rooms. It has temple features, too, suggested by the plan of the central rooms with an inner sanctum.

The discovery turns archaeologists to Bible history, where King Abimelech's wild and warlike reign ended in a fight at just such a temple-tower. That happened in Palestine, a little over a thousand years before Christ.

Abimelech and his army had destroyed one such tower, by burning it and a thousand men and women inside, according to the Bible Book of Judges. Attacking another city, he found that the men and women had fled into a tall tower in the city, and he tried to burn it, too. But a woman hurled down a stone on the king's head, and the dying Abimelech forced his armor-bearer to kill him with a sword, that it might never be said he was killed by a woman.

That this type of round temple-tower was old fashioned in Old Testament days, already several thousand years old, had not been suspected.

Digging at Tepe Gawra has been pushed through 13 levels of occupation, revealing city life at the earliest stage yet found. But more antiquity is in store for the diggers. For there remain seven or eight deeper layers of civilization which are now to be explored.

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SURGERY

Surgical Operation on Nerve For Severe Diabetes Reported

A SURGICAL operation to relieve severe diabetes was reported by Drs. Fred A. Hitchcock and George M. Curtis, of Ohio State University, at the meeting of the American Physiological Society.

The patient, one of the first to undergo this operation, which has only recently been developed through animal studies, was a young lad suffering from very severe diabetes. To control the condition he had to take one hundred units of insulin a day. This is a large dose and the cost of the treatment had become excessive for this patient. His physician had read reports of the operation performed on diabetic dogs and asked the Ohio investigators if they could not use the same surgical method to help his patient.

Arrangements were made whereby the patient became a "research project" —a human guinea pig—who let the scientists make important studies on him in return for the benefit he derived from the operation. This consisted in cutting the splanchnic nerves in the back of the chest. Following the operation the patient was able to get along on about half the amount of insulin he had been taking.

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CHEMISTRY

Chemical Yardstick Used To Classify Coal

A NEW chemical yardstick for determining the qualities of coal was reported to the American Chemical Society at its Kansas City meeting.

It allows scientists to go back through the millions of years in coal's prehistoric history and put their fingers on long past happenings that make one kind of coal differ from another.

Different kinds of coal, reported Prof. H. L. Olin of the State University of Iowa, have a strong attraction for oxygen and it is this affinity which is used as the basis for the new chemical test.

Coal, Prof. Olin recalled, is the fossil remains of ancient vegetation, and the various kinds of coal represent different ages of this fossilizing process.

Peat is a relatively young coal which has changed but little from the reeds and grasses of the bogs in which it was formed. Lignite has gone a step further in coal's life history. It has the appearance of coal but retains the woody structure of the long departed parent plants.

Going up the geological family tree of coal, the various bituminous grades and finally anthracite are reached. All the while the buried coal mass is changing chemically with a loss of hydrogen and oxygen and a concentration of carbon.

Using the chemical, potassium permanganate, as the oxidizing agent, Prof. Olin has made a study of various coals from the lignites of North Dakota to the semi-smokeless coals of West Virginia. The oxygen test, he declares, places these coals in their order of rank as determined by other less simple methods. The new development, the Iowa scientist believes, should prove useful in the work of establishing an official method of coal classification.

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CHEMISTRY-ENGINEERING

Chemists Debate Value of Alcohol Blend for Car Fuel

Advocates of Blended Fuel Believe Problem Linked With Agricultural Salvation; Others Fear Competitor

THE long-impending battle over the use of alcohol as a blending agent for gasoline in motor fuel reached a climax at the meeting of the American Chemical Society, in Kansas City, Mo.

Through a maze of technical phraseology, chemical symbols, and graphs, five speakers spoke more than 20,000 words —not counting discussion—concerning how and by whom the motor fuel of America's trucks and automobiles shall be supplied.

Three camps were distinctly apparent in the conflict. On one side was the powerful petroleum industry. At the opposite extreme were those led by the Chemical Foundation, working to demonstrate that a blend of alcohol and gasoline is a perfectly good and practical fuel for motor cars.

Midway between these groups were those men who are concerned with the scientific sides of the problem only and not the vast economic aspects which constantly hovered in the background.

The petroleum industry sees, in the rise of alcohol blends of gasoline, a potential competitor which will cut gasoline consumption. The millions upon millions of dollars invested in oil fields, wells, refining plants and enormous distributing systems are at stake.

Advocates of alcohol fuel blends see the problem intimately linked with the agricultural salvation of the nation, for behind the drive for alcohol-gasoline blends as fuel is the hope that this alcohol will be made from farm crops. And that the American farmer will thereby have another outlet for his crops over and above use for foodstuffs.

Legislative Problem

For months in the legislatures of the Midwest the alcohol fuel blend problem has been a topic of discussion. At the chemists' meeting the petroleum industry fought back.

"Proposals for compulsory blending (of alcohol and gasoline) can only be regarded as an indirect and inefficient type of subsidy to certain agricultural groups at the expense of the general public," declared Drs. Gustav Egloff and J. C. Morrell of the Universal Oil Products Co., Chicago, Ill.

The U.O.P. Co. is the holder of basic chemical patents for certain cracking processes in gasoline making. These patents are licensed to various oil companies.

Speaking for the alcohol blend side of the picture was Dr. Leo M. Christensen, formerly of Iowa State College and whose researches are now financed by the Chemical Foundation, who said:

"The scientific literature is replete with reports on the characteristics of such fuels (alcohol-gasoline blends) but an economic analysis based solely upon these data is certain to be inadequate. The influence of this development upon employment, improvement in farm practice, freedom from the vagaries of international trade, provision for an imminent petroleum deficiency and other factors must be given the full consideration due them."

To Increase Employment

What Dr. Christensen is saying is simply this. The use of alcohol blended with gasoline should increase employment, improve the status of the farmer, remove the American motor fuel situation from what may happen when a great foreign oil company decides to cut prices, and provide a way out when America's natural sources of petroleum are diminished in the future.

Point is given to the drive that the Chemical Foundation is making for alcohol-gasoline blends from farm products, by its new plant for making alcohol from corn, just going into production at Atchison, Kansas, as a practical large-scale demonstration.

The plant will produce 10,000 gallons of anhydrous alcohol daily from 4,000 bushels of corn. Thirty-two tons of protein cattle feed will be a by-product. Other farm products, such as low-grade oats, barley, wheat and potatoes, can also be utilized for alcohol production. The material employed at any given time will depend on the crop conditions.

The ethyl alcohol produced by the operators, the Bailor Manufacturing Company, will sell for 25 cents a gallon and the final blend of alcohol and gasoline sells for the same price as a premium straight gasoline of comparable octane rating. Standard approved denaturants will be used to make the alcohol unusable for beverage purposes.

Treading the middle-of-the-road path between these two extremes is a difficult task scientifically or otherwise. One scientist who did it successfully in the motor fuel symposium was Dr. Oscar C. Bridgeman of the National Bureau of Standards in Washington, D. C. Shying sharply from any touch of the economics of the problem, Dr. Bridgeman analyzed the vast amount of technical findings already available and showed, as a major contribution, why there are such widely different claims with regard to how well blended gasoline and straight gasoline work in an internal combustion engine.

Claims Differ

Just as a sample of how these claims differ, Drs. Egloff and Morrell declared:

"The increased fuel consumption of a 10 per cent alcohol-gasoline blend is four to five per cent higher than gasoline based on both road and block tests."

By contrast Dr. Christensen said: "It may be concluded, however, that the substitution of alcohol blends containing not more than 25 per cent of ethyl alcohol by volume for gasoline . . . will result in no decrease in power output or increase in specific fuel consumption."

Dr. Christensen added that there may even be less fuel consumption in everyday driving practice because the effect of adding alcohol to gasoline is to create a fuel which corresponds to a leaner carburetor mixture. Since many people drive with a carburetor mixture just a bit too rich for economical operation, the change to a blended gasoline may thus bring about less fuel consumption in their cars. A 10 per cent alcohol-gasoline fuel, said Dr. Christensen, has all the advantages of ordinary straight gasoline in a purely technical sense, and in addition, on the economic side, it has the merit of providing the farm with a new, untouched market for low-grade farm products which are now so nearly valueless that it is almost unprofitable to remove them from the fields. And the poorer a given crop may be for food purposes, he pointed out, the greater is the yield of alcohol from it.

Dr. Bridgeman in his middle-of-the-road discussion brought out clearly that the results obtained from fuel tests and power outputs depend greatly on how the tests were done.

If you take your own automobile, whose carburetor is adjusted for the best gasoline consumption, and try an alcohol-gasoline blend in it you may get a lower mileage. Dr. Christensen claimed that some drivers will find a greater mileage, and Dr. Bridgeman agreed with this finding in part. But, on the average, for all cars tested the different mileage is quite negligible; two ten-thousandths of a gallon of fuel per mile of travel.

Or, said another way, if you drove a car 5,000 miles with alcohol-gasoline fuel it would take one more gallon of fuel than if you used straight gasoline.

Another Test

Still another way to test the two types of fuel is based on the octane rating of the fuels. Adding alcohol will increase the octane rating of the fuel slightly. Octane rating is a measure of the bumpiness of fuel explosions and is linked with smoothness of engine performance. In this test special engines designed to take advantage of the fuel characteristics are used.

Dr. Bridgeman reported on this third type of test:

"Equal or better power and acceleration per gallon of fuel consumed may be obtained from blends when comparing a gasoline and the same gasoline blended with ethyl alcohol, within the range of present-day gasolines."

But returning to the economics of the alcohol-gasoline blend. The petroleum industry is represented by the statement of Drs. Egloff and Morrell:

"The cost of alcohol-gasoline is much higher than gasoline alone and there is nothing in prospect which would decrease this cost to make it competitive with gasoline at the same price level."

The slightly higher cost, in the opinion of the people advocating the alcohol blend, would be worth while in terms of the improved agricultural conditions.

For the future, however, when gasoline resources dwindle, as they must do some day, alcohol blend fuels or some substitute for gasoline undoubtedly will come still more to the forefront of the economic picture. Throughout the world where alcohol is blended with gasoline one finds that the nations without adequate resources of petroleum are the greatest users of the blend. Such a day will sometime come for the United States and then either a gasoline substitute or a blended gasoline will be used. The question still unanswered by the current survey of the problem is: "Shall it be now or later?"

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MOST PRIMITIVE GAME

A most primitive game of a most primitive people living in Venezuela, the Yaruro Indians, is being manipulated by Miss Ernestine W. Singer, of the staff of the University of Pennsylvania Museum. The stick put up in the sand represents the center of the world and of all things. Around it dance the people. In the inner circle are the men led by the "shamen" or priest; in the outer circle the women, led by the priestess. The figures are of clay and crude differences exist between the male and female figures.

MEDICINE

Prehistoric American Indians Suffered From Syphilis

SYPHILIS, blackest of plagues to modern humanity, was also a scourge to Indians who lived on this continent long before the coming of the white man. Such is the conclusion strongly indicated by evidence offered before the meeting of the American Association of Anatomists in Durham, N. C.

The evidence consists of disease-marked bones found by a joint expedition of Duke University Medical School and the University of Alabama, in ancient burials at Moundsville, Alabama. Archaeological conditions in the mounds make it practically certain that these burials are of pre-Columbian date.

Syphilitic lesions, as nearly unmistakable as can be judged from the examination of bones alone, mark many of the skeletal remains laid out in the exhibit viewed by the anatomists. These consist largely of thigh bones, but include skulls and other bones as well. They have the swollen, overgrown, loose-textured, "rotten" appearance characteristic of bone syphilis in an advanced stage. There are one or two other bacterial infections that can have somewhat similar effects on bones, but a number of medical specialists who have examined these specimens agree that the weight of evidence points toward the diagnosis as given.

Other diseases also shortened and made unhappy the lives of these long gone early Americans. One skull, apparently of a man in the prime of life, had on its lower jaw a terrible outgrowth of bone, an osteoma or bone tumor, which must have been the cause of its victim's death. Other bone-diagnosed afflictions included rickets, osteomyelitis, arthritis, and fractures. What ills the flesh of these Indians was heir to, we can only guess, since nothing but their skeletons remain. But if the bones form a fair sample, life in ancient Redskin America was probably far from idyllic.

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PHYSIOLOGY

Ear Bones Not Needed In Certain Circumstances

CAN our ears work all right without the complicated apparatus of little bones in the middle ear that our schoolbooks taught us were an indispensable part of the hearing apparatus?

Experiments by Dr. Stacy R. Guild, of the Johns Hopkins University, reported to the American Association of Anatomists, indicate that under certain circumstances at least these "ossicles"—hammer, anvil, and stirrup—are unnecessary for the transmission of sound.

Dr. Guild, by very delicate surgical methods, put out of commission one of the little bones in the ear of an etherized cat. Then he inserted an electrical contact into the inner ear, hooked up with a six-tube amplifier.

Sounds were conducted into the bones of the cat's head through a piece of wood held against the skin. They came out through the amplifier undistorted in the lower tones, and but little distorted in the higher tones, even though the supposedly necessary train of little ear bones had been interrupted.

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PUBLIC HEALTH

Health Service to Help Prevent Industrial Diseases

PLANS for preventing future Gauley Bridge tragedies were discussed at the Conference of State and Territorial Health Officers with the U. S. Public Health Service in Washington, D. C.

Using funds provided by the Social Security Act, the federal health service is ready to help state health departments establish units of industrial hygiene to study and find means to prevent the industrial hazards in each state.

Most important industrial diseases in this country are the dust diseases. Among these are silicosis, blamed for the deaths of hundreds of workers at Gauley Bridge, W. Va., and the similar lung diseases, anthracosilicosis of coal miners and asbestosis of the asbestos industry. Skin diseases make up another important group of industrial or occupational diseases. While these do not threaten the worker's life, they are the cause of much lost time.

Until this year only four states, Connecticut, Ohio, Mississippi and Maryland, had industrial hygiene divisions in the state health departments. These four states spent together about $40,000 annually on the prevention of industrial diseases. New York State and Massachusetts handle the problem of industrial disease through their departments of labor.

After July 1, industrial hygiene units will be started in eight more state departments of health. These units will be financed partly by the U. S. Public Health Service and partly by the individual states. Instead of $40,000, some $300,000 will then be spent annually on industrial disease prevention. This amounts to about 15 mills per worker for those states, and is not large, it was pointed out, when compared with the half million dollars paid out in compensation for occupational diseases by New York State alone during 1934.

Science News Letter, April 25, 1936

ANTHROPOLOGY

Eye Better Than Microscope In Studying Human Hair

HERE is a scientific paradox. The eye is more reliable than the microscope, in most cases, in scientific study of the hair of human races.

This conclusion was reported to the central section of the American Anthropological Association by Miss Mildred Kneberg, of the University of Chicago.

Early studies of human hair under microscopes had apparently settled the traits of hair in neat order. Wavy or kinky hair was declared to look flat-shaped when a tiny cross-section was examined under a powerful lens. The straightest of hair, found in Mongolians, was the roundest. And the rounder the hair shaft the lighter it was in weight.

Miss Kneberg explained that with improved methods of microscope study many of the tiny differences have turned out to be variations, which can be observed on a single head and often on a single hair.

"The shape of the cross-section of a hair," she stated, "will not tell whether it is straight or curly. The weight of a given length of hair depends on the size of the hair shafts and not on the pigment or air contained in the hair."

Stressing importance of human hair as a criterion in classifying men into races, Miss Kneberg urged that the color, form, and size of hair and the age of the individual be statistically treated together, to produce more accurate records of the hair of different racial groups. She also urged that genealogical information about hair be obtained, to shed light on inheritance of hair traits and effects of race-crossing.

Science News Letter, April 25, 1936

IN SCIENCE

PHYSIOLOGY

New Role For Pituitary—It Controls the Spleen

DISCOVERY of a new activity of the pituitary gland and possibly of a new pituitary hormone was reported by Dr. David Perla of New York City to the American Association of Pathologists and Bacteriologists.

The new hormone from the powerful but tiny gland in the head stimulates the spleen. This important organ is endowed with enormous recuperative powers, so that when a part of it must be removed because of disease, or is damaged, the organ regenerates itself, forming new spleen tissue to replace that lost. In animals the spleen cannot regenerate when the pituitary gland has been removed, Dr. Perla found. Doses of pituitary gland extract, however, renewed the regenerative power of the spleen in these animals whose own pituitary glands had been removed. These and similar studies indicate that the pituitary, besides influencing growth, sexual development and other body activities, also has control over the spleen.

Science News Letter, April 25, 1936

ASTRONOMY

Mirror Starts Long Siege Of Having Its Face Rouged

THE great 200-inch mirror disk is now having its face rouged after a successful but uneventful special train trip across the continent from its furnace-birthplace in Corning, N. Y.

Mounted under the special grinding machine which has been practicing upon lesser glass disks for many months, the great mirror will be subjected to a long siege of exacting optical work. First the gentle but persistent grinding will transform it into a perfect spherical surface. Later it will be given its final and more complex shape that will catch and focus on Mt. Palomar light from the depths of the universe.

Rouge, not unlike the sort used upon feminine faces, is the very fine abrasive used in the finishing process. The careful shaping of the mirror will take years.

Science News Letter, April 25, 1936

E FIELDS

ASTRONOMY

Pieces of Exploding Star Made Separate Spectra

ALTHOUGH it has faded, Nova Herculis, the star in the constellation of Hercules that was seen to flash out from previous obscurity at the end of 1934, is still engaging the attention of astronomers.

Several months after discovery, it was observed to break into two parts, and each part seems to have produced its own spectrum, in the series of dark lines seen when its light was analyzed through the spectroscope. This is the suggestion of Dr. W. W. Morgan, of the Yerkes Observatory. (*Astrophysical Journal.*) In January, 1935, two sets of these lines were observed, but at the time they were difficult to explain.

When the star broke into two, one component seems to have been traveling in our direction at a speed of 530 miles per second, while the other was receding at 675 miles per second. This is the reason that the lines were seen in duplicate. The lines from a body traveling earthwards are shifted to the blue end of the spectrum, while those from a star speeding away are moved to the red. Had both pieces been traveling at right angles to the direction of the earth, their spectra would have merged.

Science News Letter, April 25, 1936

PHYSIOLOGY

Fish with Parts of Brain Have Abnormal Breeding

SEX-LIFE is not commonly supposed to require much in the way of brains, but Dr. G. K. Noble of the American Museum of Natural History in New York City has found out that it does, at least among fishes. At the meeting of the American Association of Anatomists at Durham, N. C., he reported his researches bearing on the subject.

Dr. Noble experimented on cichlid fishes, a large class of small-sized tropical fishes, some of which are kept as pets. Surgical operations, even radical ones removing a large part of the brain, never seem to bother a fish. It goes on living normally, except for changes in behavior brought about by the absence of parts of the governing mechanism.

Dr. Noble's fishes, for example, got along all right with a considerable part of their forebrains gone, except in the somewhat complicated business of egg production and rearing the young. If the cut went too far back in the brain, the eggs could not even be laid and fertilized. Bits of pituitary gland from frogs implanted in the heads of the operated fishes enabled the females to produce eggs, but did not restore normal mating behavior.

Another curious effect of the brain-removing operations was noted in the social behavior of the fish. Normally fish of this class swim in schools, wheeling and maneuvering in the water like birds in the air. But the operated fish could no longer follow the movements of their school, and would swim off at a tangent when their companions made a turn.

Science News Letter, April 25, 1936

MEDICINE

Pneumonia After Operations Studied in Animal Tests

FIRST experimental production of a lung condition and subsequent pneumonia, seen in human patients following extensive surgical operations and other conditions, was reported to the American Association of Pathologists and Bacteriologists by Drs. Virgil H. Moon and David R. Morgan of Philadelphia.

Such studies of how the serious problem of post-operative pneumonia is caused may enable physicians to prevent it.

The condition is associated with failing blood circulation and may develop in patients following superficial burns of the skin, in toxic conditions linked with childbirth, jaundice or diabetes, and following overdoses of sleeping powders and other drugs. In these conditions the lungs become water-logged, resembling a sponge from which quantities of fluid can be squeezed. Lungs in this state are easily infected and when the condition known as edema arises, pneumonia frequently follows and causes death.

The Philadelphia scientists were able to produce the same condition in animals by various procedures such as superficial burns, prolonged treatment with sleeping powders and intoxication by bile injections. Four or five days later the animals regularly developed a form of pneumonia seen in human patients under similar conditions.

Science News Letter, April 25, 1936

PSYCHOLOGY-PHYSIOLOGY

Parental Instinct Not Due to Glands Alone

PARENTAL instinct, in the mouse at least, is not a matter of the pituitary gland and its hormones alone, it appears from studies reported by Drs. C. P. Leblond and W. O. Nelson of Yale University School of Medicine to the American Association of Anatomists.

Possibility of a nervous mechanism being involved is suggested by the Yale investigators. As they see it, parental instinct may be first awakened by the pituitary gland hormone, prolactin, which controls lactation. This phenomenon was reported by Dr. Oscar Riddle and associates of the Carnegie Institution of Washington's laboratory at Cold Spring Harbor, N. Y. The instinct to care for one's young, however, may be independent of lactation. Once aroused, it may continue without the influence of the hormone, possibly coming under nervous control at this stage.

Experiments with mice provided the basis for this theory. In these animals, the parental instinct appears to a slight degree at puberty, the Yale scientists reported, but is markedly increased in both sexes when the young mice are born. When the pituitary gland is removed in females that are nursing their young, lactation stops, but the mice continue to take good care of the young in other ways.

Science News Letter, April 25, 1936

LANGUAGE

Candidates Get Their Name From Old Roman Custom

MODERN politicians inherit the name candidate from the old Romans. But most office seekers never heard of the costume that fits the title.

Office seekers were called *candidati*, meaning men in white, by the ancient Romans, says Dr. H. J. Leon of the University of Texas Department of Classical Languages. The nickname fitted in those days, because office seekers advertised themselves, wherever they went, by wearing wool togas made superwhite by rubbing in fuller's chalk.

"This was undoubtedly a convenient and happy practice," comments Dr. Leon, "but there is no evidence that it did away with baby kissing."

A news report that the Romans wore white linen togas was discounted by Dr. Leon, who stated that Roman togas were always of wool.

Science News Letter, April 25, 1936

ASTRONOMY

Planets Now Returning

Seldom-Seen Mercury Will Make a Brief Appearance About May 7; Jupiter Visible Throughout the Month

By JAMES STOKLEY

AFTER several months in which planets were absent from the evening sky, seldom-seen Mercury appears for a few days about May 7. All through the month Jupiter will be visible. The accompanying maps are intended to show the appearance of the skies at 10:00 p.m. at the beginning of the month, 9:00 p.m. at the middle, and 8:00 p.m., at the end.

On May 7 they show them as they are about 9:30. Mercury has set by that time, so it is not indicated. However, it should be easily visible soon after dark, in the northwestern sky, close to the horizon. It will then be about as high as Aldebaran, the red star marking the eye of Taurus, the bull, but farther north, and a little brighter. The map shows Capella, the bright star in Auriga. Taurus is just below.

Jupiter is in the constellation of Ophiuchus. At the beginning of the month it rises in the southeast, a little after ten o'clock, but at the end it appears at just about eight, so it is placed on the map for that date. There will be little difficulty in finding it since its magnitude is minus 2, brighter than any other star or planet now visible at any time in the night. Saturn rises at about 2:30 a.m., as a morning star, while Venus and Mars are too close to the sun to be seen at all.

Familiar Guide

The most conspicuous of the springtime stars may be easily found from the Great Dipper, now high in the north. The handle of the dipper curves around to the southeast, and if you follow its curve, you soon come to the bright star Arcturus, in the constellation Bootes. Still farther, and almost directly south for the times of the maps, is Virgo, the virgin, with the star Spica. On the map the pointers, the two stars of the bowl of the Dipper farthest from the handle, are indicated. The arrow points toward Polaris, the pole star. By following them in the opposite direction, towards the south, you are brought to the sickle, part of Leo, the Lion. The star at the end of the handle of this implement, just now in such wide use, is Regulus.

To the west and northwest three other first magnitude stars can be seen, the only remainder of the brilliant stellar display of winter. Directly west is Canis Minor, the little dog, with Procyon; just north is Gemini, the twins, with Pollux to the south; still farther north is Auriga, the charioteer, with Capella.

Taking the place of these, some other groups, that will be conspicuous in the summer evenings, are now making their appearance in the northeast. The brightest star in that direction is Vega, part of Lyra, the lyre. Above it is Hercules, and below is Cygnus, the swan, with the first magnitude Deneb.

Scorpius in Southeast

Another summer evening group now beginning to appear is Scorpius, the scorpion, low in the southeast. Until late in the evening only a small part is visible, but it is the part that contains its brightest star, Antares, which marks the scorpion's heart. Its red color makes it easy to identify, and there will be no difficulty in mistaking it for Jupiter, because that planet is much brighter, and rises a little later.

The map shows the location of Centaurus, low in the south, but the stars of this constellation visible from most of the United States form only a small and inconspicuous section. From the extreme southern parts of the country, where the latitude is less than 30 degrees, its most brilliant stars, alpha and beta Centauri, are seen above the horizon. The former is conspicuous because it is the nearest naked-eye star, at a distance so close that its light, traveling 186,000 miles every second, takes only 4.2 years to reach us.

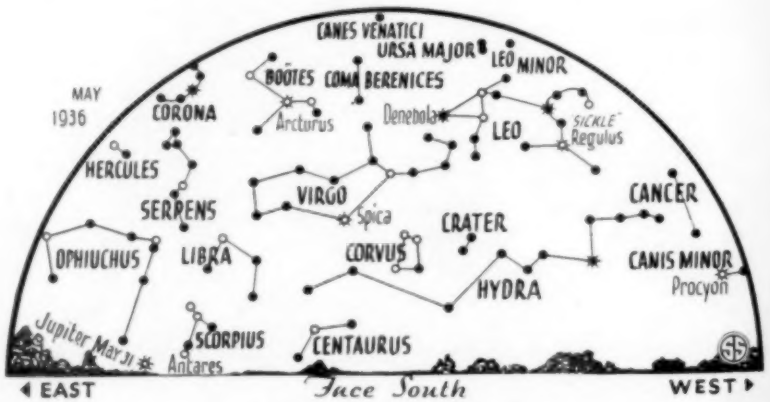
Shy Mercury

When Mercury reaches its greatest distance to the east of the sun on May 7, and is seen for a few days before and after that date, we can look at a planet relatively few people have ever seen, and one that has long been a source of mystification. Mercury is only 36,000,000 miles from the sun, instead of 92,900,000, the distance of the earth. It will then be 79,752,000 miles from earth.

When farthest east of the sun, as this month, it follows that body and is visible for a short time in the early evening. Then it comes almost in line with the sun and is not visible, but later it is to the west, when it rises before dawn as a morning star.

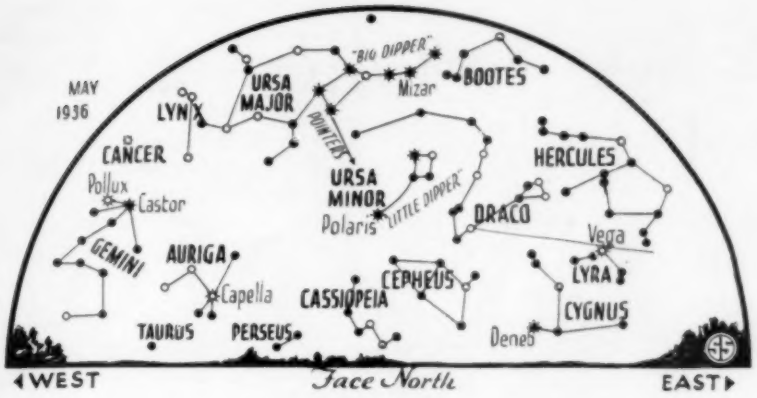
The ancients noticed it in both positions, but supposed that they were looking at two separate planets. The one they saw in the morning they called Apollo, that of the evening, Mercury.

☼ ✸ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



RETURNING ONCE MORE

Low in the southeast during the coming month, you may see the planet Jupiter, first of the planets to return to the evening skies.



THE POINTERS

Do you know all the stars that can be located through that helpful landmark, the familiar Great Dipper? Follow the pointers to Polaris, the navigator's friend. Follow the handle to bright Arcturus.

The outstanding problem concerning Mercury today is whether or not it has an atmosphere. Theoretically, it cannot possess one. For every planet there is a certain "velocity of escape," a speed at which an object thrown upwards will leave the planet entirely. For the earth this is about seven miles a second, and this applies not only to objects like stones or bullets, but also to molecules, such as those forming the gases of our atmosphere. These molecules are in rapid motion, but they seldom attain this velocity, otherwise they would fly off into space and the earth would lose its air.

Mercury's Mass Less

But the mass of Mercury is about a twenty-fifth that of earth, its gravitational pull is less, and there the velocity of escape is only 2.2 miles per second. Because Mercury is close to the sun, its temperature is much higher than ours, and this would make the molecules move faster. Consequently, it is argued, they would often move fast enough to leave the planet's attraction, and therefore Mercury must have lost its original atmosphere ages ago.

However, there is observational evidence to the contrary. Dr. E. M. Antoniadi, a famous planetary observer connected with the Paris Observatory, has reported seeing clouds on Mercury. An English amateur, H. McEwen, director of the Mercury and Venus Section of the British Astronomical Association, claims to have confirmed the Frenchman's conclusions. And if there are clouds, there must be some atmosphere to hold them.

In just a year, it may be possible to test the accuracy of these data. At rather rare intervals, Mercury passes directly between the sun and earth, when it can be seen as a dark spot on the solar surface, when it is examined with a telescope equipped with proper protection for the eyes. Usually, when the planet is on the side of the sun towards the earth, it is either above or below the solar disk.

Next May such a transit will occur, but it will be of a very peculiar kind, one that happens only once in nearly a thousand years. In England and northern Europe, the planet will miss the sun's disk, but by such a narrow margin that in southeastern Europe and Africa it will skim along the edge, remaining there for about forty minutes. This will give time for rather detailed examination, to find whether the telescope shows a halo of light around the half of the planet's disk that is not in front of the sun.

If there is an atmosphere, such a halo should be seen. The layer of air would bend the sun's rays around as at twilight on the earth, so that the complete circle of the planet would be visible. If there were no atmosphere, however, only the part of the planet that is actually in front of the sun should appear.

During May, the moon will be visible in the evening from the beginning of the month to about the ninth, and from about May 23 to 30. Its phases are: Full moon, May 6 at 10:01 a.m., Eastern Standard Time; last quarter, May 14, at 1:12 a.m.; new moon, May 20, at 3:34 p.m., and first quarter, May 27, at 9:46 p.m. The moon is farthest from earth on May 3 at 7:00 a.m. (distance 252,300 miles), and nearest the earth on May 18 at 10:00 p.m. (distance 224,550 miles). It will be at apogee again on May 30 at 10:00 p.m. (Distance 251,700 miles).

CHEMISTRY

Food Drugs and Poisons Reviewed in New Volume

COSMETICS that quite literally "put your eye out," foods that have less quality in the package than they have in high-priced magazine advertising, patent medicines "testimonialed" in the same newspapers that carried the death-notices of their recommenders, are passed in review in a new book by Ruth deForest Lamb, Chief Educational Officer of the U. S. Food and Drug Administration. (*American Chamber of Horrors:* Farrar and Rinehart.) The book is in large part the story of the struggle over the Copeland bill, due to come up for action before the adjournment of the present Congress.

This bill has been considerably modified from the form in which it originally appeared, in the days when it was dubbed the "Tugwell Bill" by its opponents, who hoped to damn it by giving it a "bad" name. Some of the provisions which have been taken out Miss Lamb regrets, notably the grading provisions for canned goods and other packaged foods. She relates case after case of misguiding labeling that is still not misbranding according to the letter of the law, naming a number of highly advertised products and telling of the activities of their manufacturers and advertisers, whom she also names. Yet despite these lacks in the revised bill, Miss Lamb feels that it should be enacted, as the best that we are likely to get at the present time, and certainly as an advance over the present thirty-year-old Wiley Act.

One story told by Miss Lamb, that has not been covered at all in other recent books that tell the consumer what a sucker he often is, comprises the chapter, "How Much Poison?" It concerns the struggle over the knotty problem of spray residues on fruits. Fruit must be sprayed, at present mainly with lead arsenate, a double poison. If this is not done, the insects will get it before we do. But the poison spray sticks on, and since both arsenic and lead are cumulative poisons, piling up in the body until there is enough to cause serious illness, the spray residue must be eliminated before the fruit can be safely marketed. Efforts to introduce really effective spray residue removal, particularly in Pacific Coast orchard regions, have provoked some of the bitterest agrarian fights in recent history, rising at times to threats of murder, mayhem, and mobbing.

PHYSICS

Atoms and Cosmic Rays Yield New Science Knowledge

Annual Report of Bartol Research Foundation Tells Of Many Programs of Research Now in Progress There

LATEST news from the interior of the atom and the depths of space are blended in the annual report of Dr. W. F. G. Swann, director of the Franklin Institute's Bartol Research Foundation laboratories. These laboratories are devoted entirely to the study of the nuclei of atoms and of cosmic radiation.

Perhaps it seems strange that atomic cores and cosmic rays should both be chosen as subjects for a single research program.

Their connection, however, is quite intimate. First, the various kinds of cosmic ray particles are known to be identical with those particles shot out by the nucleii of radioactive atoms. Second, one way to learn about nuclei is to bombard them with high speed particles like cosmic rays; or, by watching what happens when cosmic rays themselves hit the atomic cores.

Some of the researches which Dr. Swann described were:

1. A cyclotron for nuclear investigations is being installed in collaboration with the Franklin Institute's Biochemical Foundation.

2. Dr. L. H. Rumbaugh has succeeded in separating the isotopes of lithium, thereby producing the lightest solid ever found at ordinary temperatures.

3. Dr. G. L. Locher and C. L. Haines are testing the Einstein mass-energy equivalence in the process whereby a gamma ray photon is converted into a pair of oppositely charged electrons. Verification has been established within a few per cent. The remaining discrepancy may furnish vital information about nuclear behavior.

4. Results of the recent stratosphere flight confirm Dr. Swann's theory that most of the observed rays are secondary particles knocked out of atoms of the atmosphere by the primary rays. Data from the balloon also shows that the rays are strongly deflected by the earth's magnetic field.

Data From Balloons

5. Dr. T. H. Johnson will soon send up unmanned balloons for cosmic ray data in the stratosphere. The balloons and their equipment will probably be lost but in the meantime will have automatically radioed back the desired information.

A feature of this equipment is a novel type of power plant for supplying high voltage to the cosmic ray counters. The entire equipment dangles on a string from the balloon. It will be falling slowly, however, during the entire flight, like the weight in a grandfather clock. The energy thus generated is used to drive a compact electrostatic machine.

6. An automatic cosmic ray recording equipment was sent on shipboard to Valparaiso, Chile, and return, by Dr. Johnson. The results reflect local variations in the strength of the earth's magnetic field.

7. Drs. G. L. Locher and L. H. Rumbaugh are examining photographic plates which were carried to the stratosphere on the recent flight. High speed electrical particles produce tracks in the photographic emulsion which can be seen with a microscope. Different kinds of particles can be distinguished by the kinds of tracks which they leave. According to Compton and Bethe most of the rays at high altitudes should be alpha particles, but these plates say that the number of such particles is less than one per cent of the total. At sea level few if any of the rays are protons. The plates also suggest that a certain small percentage of the cosmic ray energy at high altitudes is conveyed by neutrons.

8. Examination of rays which have reached the ends of their paths has shown that very few of them are protons, at sea level. (Dr. Swann, W. E. Ramsey, Dr. C. G. and D. D. Montgomery.)

9. The total amount of ionization produced by a cosmic ray in passing through a gas was studied by Dr. W. F. G. Swann and W. E. Ramsey with a combination of ionization chamber and Geiger counters. Dr. W. E. Danforth is studying the primary ionization (number of atoms shattered per centimeter of path by the original ray, not counting branch tracks) by determining the efficiency of Geiger counters at different pressures.

10. W. E. Ramsey has shown that at least 75 per cent of all nuclear bursts accompanying cosmic radiation are produced by photons, not by charged particles.

11. It has been customary to say that there were two distinct types of cosmic-ray-nuclear bursts, those in which only a few particles are ejected, and those involving a very large number, thousands even, of particles. Dr. and Mrs. Montgomery have shown that no such distinct classification is possible, that any size of burst may occur, and that they probably all arise from the same kind of process.

Science News Letter, April 25, 1936

The Highway Research Board

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AVIATION-FORESTRY

Bombing Planes to Fight Fires with Chemicals

BOMBING planes to stop fire and destruction, rather than cause it, are to be experimented with by the U. S. Forest Service. Ordinary explosive bombs of the military type will be tried for their possible usefulness in throwing dirt on fires, retarding their spread until ground crews can arrive. Chemical bombs, particularly those containing the "froth" type of fire extinguisher, are considered promising, at least in the combating of small fires.

Another possible usefulness of bomb-dropping planes is to deliver food and supplies to ground crews of fire-fighters in isolated positions, as planes have been used to drop food and medical supplies to towns cut off by disaster.

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PLANT PATHOLOGY

NATURE RAMBLINGS
by Frank Thone

War Among the Elms

ELMS are putting forth their young leaves through all the land where winter has given place to spring. Through all the land, people who love elms are renewing their anxiety over the menace of the invading fungus enemy, beetle-borne, called (most unjustly to Holland!) the Dutch elm disease.

In New England especially, famous for its elm-arched towns, eyes of concern are turned toward the 45-mile area around New York, which is as yet the only firm foothold the invader has succeeded in gaining on this continent. Prof. J. H. Faull of the Arnold Arboretum of Harvard University speaks a timely word in favor of vigorous and unstinted effort toward total eradication of the plague, and against half-way "control" measures which have been proposed in some quarters because full eradication is such an expensive business.

The cost of elm disease eradication undoubtedly is high, because it involves the cutting down of diseased trees as fast as they are found, and burning them to the last twig. Only thus can the supply of fungus be taken away from the beetle bearers. But Prof. Faull, who is no more reckless about the expenditure of public funds than other New Englanders, offers telling argument in support of the idea of ultimate economy by spending now:

"That matter must be faced regardless of what is done about our elms, whether we try to save them or leave them to their fate. It may readily be admitted that considerable cost will be incurred in carrying through the eradication project because it will take several years to bring it to completion. But costs are sure to be *many, many* times greater if we do not eradicate the Dutch elm disease.

"To my mind there is no alternative. So-called 'control', short of eradication, may defer the loss of our elms; but the conclusion in Holland, where essentially such a measure is being practiced, is that the elms will eventually go.

"Actually such 'control' may be more costly in the aggregate than doing nothing at all. If our elms be allowed to die there will be unavoidable costs of removal and these will be huge because of the vast number of trees involved. Then there will be costs of replacements, losses of property values, and the sad loss of the American elm for planting—a tree for which there is no equivalent."

Science News Letter, April 25, 1936

PSYCHOLOGY

Best Books and Best Sellers Written by Young Authors

BEST sellers are most frequently written by young writers between 40 and 44 years old, Dr. Harvey C. Lehman, of Ohio University, told the psychology section of the Ohio Academy of Sciences.

When Dr. Lehman speaks of best sellers, he does not mean those works that flare into popularity for a period only to fade out like a rocket or a hit-of-the-week song. He means those books that have sold in enormous quantities over a long period of time. "In His Steps," for example, published in 1896 by a Kansas minister, Charles M. Sheldon, is said to have sold more than 20,000,000 copies. And it is estimated that 50,000,000 copies of "Uncle Tom's Cabin" have been sold.

"Such best sellers are books that make a very strong appeal to humanity in general," Dr. Lehman said. "In many instances they are books which appeal strongly to children and to semi-literates."

Books judged by critics to be among the world's best are also most likely to be written by authors between 40 and 44, Dr. Lehman found.

Women writers are likely to publish their greatest works at a somewhat earlier age. Their peak is reached between 35 and 39.

This does not mean that beyond that age, authors lose their ability to do creative writing. Good books are often written by writers of advanced age. Goethe was over 80 when he published the second part of the great "Faust." But such occurrences are the exception rather than the rule.

"Best books have, of course, been published by authors of almost every chronological age level beyond early youth," Dr. Lehman said. "Literary masterpieces of the first rank have been published most frequently, however, by men who were not beyond their forties. The age curves suggest that it would be highly absurd to attempt to establish a deadline.

"Do the decrements at the older age levels imply a corresponding decrement in the ability to write creatively? Certainly not.

"It seems obvious that outstanding potential ability must be present in the individual who produces literary masterpieces. However, potential ability alone does not guarantee accomplishment."

"At the older chronological age levels, some one or more of the numerous variables that are essential to the fruition of literary genius tend either to wane or to disappear.

"At the present time psychology is unable to identify all of the factors that enable a particular individual to exhibit literary genius. Therefore, in instances where the fruits of genius fail to appear, it is not possible to ascertain which of the several essential ingredients are wanting."

Science News Letter, April 25, 1936

By the Director of the
FELS PLANETARIUM

STARS *and* TELESCOPES

By JAMES STOKLEY

A complete summary for the amateur, this book gives an outline history of astronomy, describes star movements, tells where to look and what to see, shows how planetaria work, and explains the nebular theories of Eddington, Jeans, etc. "Up-to-date, comprehensive, clear." —*Harlow Shapley*, Harvard Observatory. Fully illustrated. $3.00.

Harper & Brothers
49 E. 33rd St., New York City

•First Glances at New Books

Physics

COSMIC RAYS THUS FAR—Harvey Brace Lemon—*Norton,* 128 p., $2. Prof. Lemon traces the historical development of cosmic radiation from its beginnings to March, 1936. Written in his characteristically pleasing style, the book has added merit in the clever cartoon-like illustrations. The author pulls no punches in describing how the personalities of the various scientists in the field led to considerable controversy as to experimental techniques and interpretations. The book, designed for the intelligent layman rather than the scientist, is naturally without a detailed bibliography.

Science News Letter, April 25, 1936

Chemistry

AMERICAN CHAMBER OF HORRORS—Ruth deForest Lamb—*Farrar & Rinehart,* 418 p., $2.50. (See p. 271.)

Science News Letter, April 25, 1936

Ichthyology

DEEP SEAS AND LONELY SHORES—W. Lavallin Puxley—*Dutton,* 217 p., $2.50. An entertainingly written account of wonders of the abysses of the oceans and of the remote lands beyond them. Eels, sea-serpents, whales, nightmare fishes of the great deeps, butterfly fishes of the alluring tropical shallows, pass in ever-changing procession.

Science News Letter, April 25, 1936

Engineering

ELEMENTS OF DIESEL ENGINEERING, WITH QUESTIONS AND ANSWERS—Orville Adams—*Henley,* 478 p., $4. Basing his thesis on the assumption that thousands of men and young men will soon turn to the field of Diesel engine maintenance, the author presents the basic facts about this field of engineering. Every piece of Diesel literature, it is claimed, was examined in the course of writing the book, but unfortunately these literature references are not given, so that the more advanced student has to accept the volume as a secondary source of information.

Science News Letter, April 25, 1936

Biography

J. ARTHUR HARRIS, BOTANIST AND BIOMETRICIAN—Ed. by C. Otto Rosendahl, Ross Aiken Gortner, and George O. Burr—*Univ. of Minnesota,* 209 p., $2.50. The life story of a noted botanist told by three of his former associates at the University of Minnesota. Whether in the field on researches in his chosen subject of the sap of plants as influenced by ecological conditions, or as administrator of a leading research laboratory and later of the department of botany at the University of Minnesota, Dr. Harris left his mark so firmly imprinted that time will not be easily able to erase it.

Science News Letter, April 25, 1936

Botany

RAMIE—G. L. Carter and Paul M. Horton—*Louisiana State Univ.,* 100 p., $1.50. A brief but well-packed treatise on a fiber plant that is regarded as having great promise in the American field. An especially useful feature, for those interested in more detailed exploration of the subject, is a bibliography of 257 titles.

Science News Letter, April 25, 1936

Chemistry

PHYSICAL ASPECTS OF ORGANIC CHEMISTRY—William A. Waters—*Van Nostrand,* 501 p., $9.50. Elaborate and advanced textbook treating organic chemistry from the point of view of the physical approach. An extensive index and vast bibliography add to the book's merits as a reference volume.

Science News Letter, April 25, 1936

Astronomy

THROUGH MY TELESCOPE—W. T. Hay—*Dutton,* 128 p., $1.50. Mr. Hay, fellow of the Royal Astronomical Society, tells in simple language some of the fascinating facts about astronomy. An amateur astronomer by avocation, Mr. Hay's real profession is that of a vaudeville actor. His characterization of a mirth-provoking schoolmaster is well-known in England. But do not let that comment scare off the prospective reader for Mr. Hay is the man who discovered, in 1933, the remarkable white spot on the planet Saturn which professional astronomers had not yet observed.

Science News Letter, April 25, 1936

Botany

HANDBOOK OF NORTHWEST FLOWERING PLANTS—Helen M. Gilkey—*Metropolitan,* 407 p., $2.50. Teaching and field botanists in the Pacific Northwest will welcome this new flora, which puts into convenient, "Gray's-manual" form the well keyed-out descriptions of plants needed for effectual work in systematic botany. Line drawings, obviously made from either living material or from well-preserved herbarium specimens, help with many of the more difficult forms.

Science News Letter, April 25, 1936

Standardization

REPORT OF THE TWENTY-FIFTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES—*Govt. Print. Off.,* 145 p., 20c. National Bureau of Standards, Misc. Pub. M156.

Science News Letter, April 25, 1936

Political Science

NEUTRALITY, ITS HISTORY, ECONOMICS AND LAW. IV: TODAY AND TOMORROW—Philip C. Jessup—*Columbia Univ. Press,* 237 p., $2.75. The fourth and concluding volume of a series that goes into the vexed question of neutrality and makes a strong and scholarly effort to find out what is this much-desired but elusive haven of peace-minded nations in a war-bent world, and how it may be attained and kept despite the storm.

Science News Letter, April 25, 1936

Morphology

MORPHOLOGY OF THE COLEOPTEROUS FAMILY STAPHYLINIDAE—Richard E. Blackwelder—Smithsonian Institution, 102 p., 30 figures, 40c. Correction of price, incorrectly quoted in SCIENCE NEWS LETTER of March 28, 1936.

Science News Letter, April 25, 1936

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●RADIO

April 28, 2:15 p.m., E.S.T.

FARM ANIMALS—IMPROVED MODELS—Dr. John R. Mohler, Chief of the Bureau of Animal Industry, U. S. Department of Agriculture.

May 5, 2:15 p. m., E.S.T.

TESTING FABRICS WE BUY—Warren E. Emley, of the National Bureau of Standards.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

Meteorology

STUDIES OF RELATIONS OF RAINFALL AND RUN-OFF IN THE UNITED STATES—W. G. Hoyt and others—*Govt. Print. Off.*, 301 p., 25c. Geological Sur. Water-Supply Paper 772. A very timely reference work, which will have wide use in soil conservation, forestry, flood protection and prevention engineering, and many allied applications. Besides thorough general discussion there are detailed accounts of typical special cases in all parts of the country.

Science News Letter, April 25, 1936

Ornithology

A KEY TO SPECIES OF AMERICAN OWLS—Leon Kelso—publ. by author, 101 p., 7 pl., $2. Special students of this interesting and important group of birds, and indeed ornithologists generally, find this a complete analytical treatment of the group, the first covering its field since Ridgeway's work, published in 1914 and now out of print.

Science News Letter, April 25, 1936

Metalcraft

METALCRAFT FOR AMATEURS—Peter Manzoni—*Beacon Press*, 136 p., $1. Well-written shop notes for those who wish to do metal working as a handicraft.

Science News Letter, April 25, 1936

Forestry

DECAY FOLLOWING FIRE IN YOUNG MISSISSIPPI DELTA HARDWOODS—George W. Hepting—*Govt. Print. Off.*, 32 p., 5c. A brief but pertinent discussion of a major problem in the management of an important type of timber in the South.

Science News Letter, April 25, 1936

Electricity

ELECTRICAL MEASUREMENTS IN PRINCIPLE AND PRACTICE—H. C. Turner and E. H. W. Banner—*Instruments Pub. Co.*, 354 p., $4.50. A British text designed for use by engineers who are concerned primarily with the applications of electrical measuring apparatus. Much of the mathematical treatment necessary in books for students and research workers is thus eliminated. The principles of operations as well as the restrictions and limitations of the equipment are given.

Science News Letter, April 25, 1936

Electricity

ELECTRICITY IN THE HOME AND ON THE FARM—Forrest B. Wright—*Wiley*, 320 p., $2.50. In one-syllable words that anyone can understand Professor Wright gives detailed instruction on how to be your own electrician at home and on the farm. The index runs from alarm systems to making Western Union splices. Any husband, after reading this book, can amaze his wife with his ability as an electrical handy-man.

Science News Letter, April 25, 1936

Mathematics

COMMERCIAL ALGEBRA, COLLEGE COURSE—Bolling H. Crenshaw, Thomas Marshall Simpson, Zareh M. Pirenian—*Prentice-Hall*, 174 p.; tables, 19 p.; answers, vii p., $2. A textbook which is of a more utilitarian nature than the traditional college course in the subject. Designed for persons who are going into business, the technical expressions of algebra are held to a minimum.

Science News Letter, April 25, 1936

Ichthyology

FLORIDA FISHES—Harold L. Madison—*Cleveland Museum of Natural History*, 31 p., 25c. A handy little booklet-manual in an envelope, margin-punched to fit the Lefax type of notebook; therefore very convenient to take along on a fishing trip—if your good luck takes you to Florida waters. Short descriptions and clean-cut little illustrations will help you identify the strange, and often beautiful, fish that you catch.

Science News Letter, April 25, 1936

Entomology

A MONOGRAPHIC REVISION OF THE GENUS CEUTHOPHILUS—T. H. Hubbell—*Univ. of Florida*, 551 p., 38 pl., $3.75. A study of a peculiar group of cricket-like insects, often held to be rare but probably merely very elusive, that will be of high interest to systematic entomologists. Prof. Hubbell has made this a model of what monographic treatment of a taxonomic subject should be.

Science News Letter, April 25, 1936

Physics

ATOMIC PHYSICS—Max Born—*Stechert*, 352 p., $4.75. An English translation of Prof. Born's widely read German text of 1933 which has been brought up to date and contains a new chapter on the recently discovered new atomic particles and a discussion of the properties of the nucleus.

Science News Letter, April 25, 1936

Chemistry-Engineering

AMERICAN PETROLEUM INDUSTRY, A SURVEY OF THE PRESENT POSITION OF THE PETROLEUM INDUSTRY AND ITS OUTLOOK TOWARD THE FUTURE—*American Petroleum Institute*, 229 p., Paper, 50c., Cloth, $1. Facts and figures on the petroleum industry which brings the last figures (vintage 1925) up to date. A handy reference volume about one of America's greatest industries.

Science News Letter, April 25, 1936

Geology

REPORTS ON THE GEOLOGY OF CAMERON AND VERMILION PARISHES—*Louisiana Geological Survey*, 242 p., $1.00.

Science News Letter, April 25, 1936

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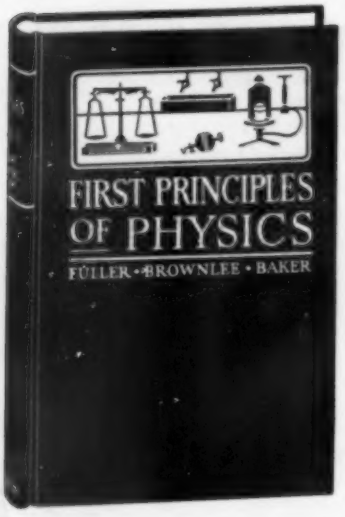
● "In certain industries technical advances are so rapid that tools and processes are being improved constantly. In other industrial groups the products are changed frequently as the result of scientific discoveries. The automobile and the radio are examples of this rapid development and improvement through research. Not only has the motor-car industry taken full advantage of the possibilities of its own research organizations, but its spectacular expansion has given stimulus to other classes of industrial research, such as petroleum products, rubber, metals, leather, synthetic fabrics, synthetic resins, lacquers, and safety glass, as well as road materials. The automobile as a unit has probably reached a stage of 10 per cent development. In the same light, we can regard the radio as but a month in age and television only a day old, with unlimited possibilities for future improvement."—Edward R. Weidlein and William A. Hamor in GLANCES AT INDUSTRIAL RESEARCH (*Reinhold Pub. Corp.*).

Science News Letter, April 25, 1936

Science News Letter will secure for its subscribers any book or magazine in print which was published in the United States. Send check or money order to cover regular retail price ($5 if price is unknown, change to be remitted) and we will pay postage in the U. S. When publications are free, send 10c. for handling. Address Book Dept., Science News Letter, 2101 Constitution Avenue, Washington, D. C.

PHYSICS AND HUMAN PROGRESS

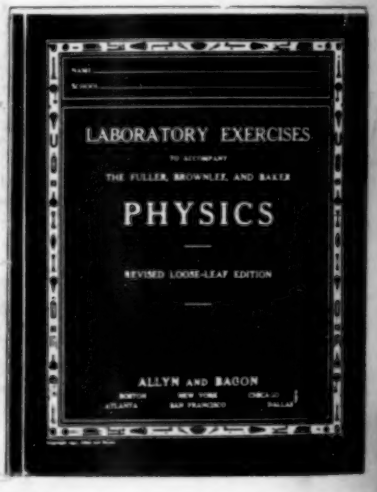
RECENT EVENTS throw into striking relief the contributions which science in general and physics in particular have made to human progress. The first event, the death of General Greely recalls the heroic struggle of his party of twenty-five men some fifty years ago. For nearly three years they lost all contact with the outside world, and when the rescue party found them only six were alive.



The experience of Greely's party brings to mind the famous expedition of Sir John Franklin and its tragic end, and the later expedition of Scott, which successfully reached the South Pole, but also ended in tragedy when the party perished before they could get back to their base.

These heroic expeditions and those of Peary and Amundsen, which though more successful, were nevertheless filled with hardship, are monuments to the indomitable will in the heart of man to surmount the obstacles that stand between him and the mastery of his world.

Physics has banished most of the terrors of arctic exploration. It has conquered the twin horrors of darkness and isolation by its development of the electric light and of the radio.



The latest evidence of these splendid contributions to the progress of science is best presented in the little message *Alive and Well.* These three words recently flashed forth from Little America to inform the world that Lincoln Ellsworth, American explorer, and Herbert Hollick-Kenyon, Canadian Royal Air Force flyer, are safe and sound after their daring Antarctic flight.

Physics gives the explorer, in the Arctic or in the interior of vast continents, conquest over space. With the camera in his airplane, he can explore and accurately record the geography of wide horizons which could not be mapped by months of travel on the earth.

Physics has gathered the corners of the earth ever closer and closer together by means of great ships that float, long trains that run on shining tracks, arched bridges that balance from shore to shore, wires that carry voices, and radios that make the world a whispering gallery.

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